Outline

- National Academies introduction

- Overview of National Academies activities related to reproducibility and open scholarship in recent years

- Ongoing and planned activities

- Key tasks and roles for societies in advancing open scholarship and reproducibility/replicability

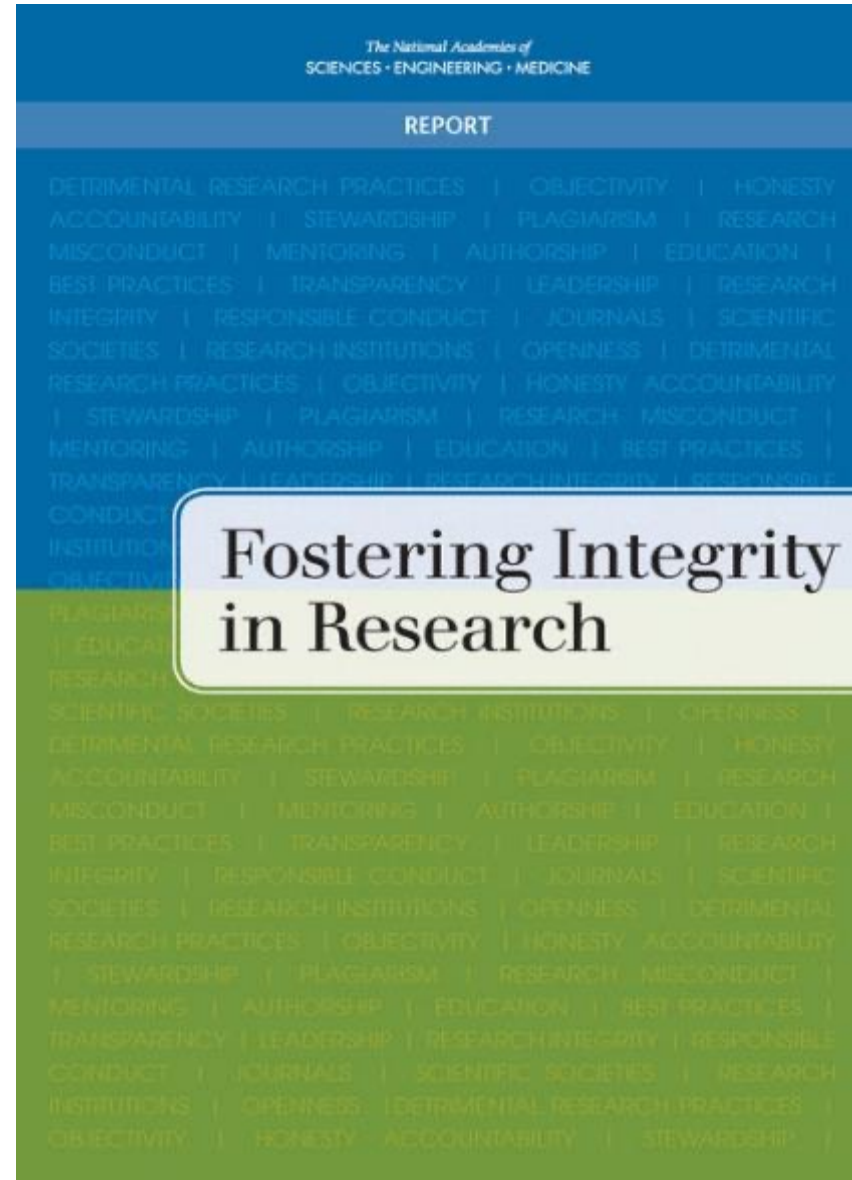# National Academies Introduction

Created to advise the Nation

- Private, non-profit, self-selecting membership organizations of eminent scientists, engineers, medical professionals

- 1863 Congressional charter to advise the Federal government signed by President Lincoln

- Organization: 7 major divisions, boards/standing committees, ad hoc committees

- Operating modes: Consensus studies, convening activities (workshops, roundtables), operational programs (fellowships, etc.)

Reproducibility and Open Scholarship

Fostering Integrity in Research

Background/Context

- Consensus study released in 2017

- Broad examination of factors that affect research integrity, research misconduct, and detrimental research practices

- Supported by Federal agencies, several societies, foundations, and NASEM

Key Findings and Recommendations

- Openness and accountability fosters integrity AND improves the quality of research

- Recommends that a new organization be established to strengthen institutional capacity to address threats to research integrity
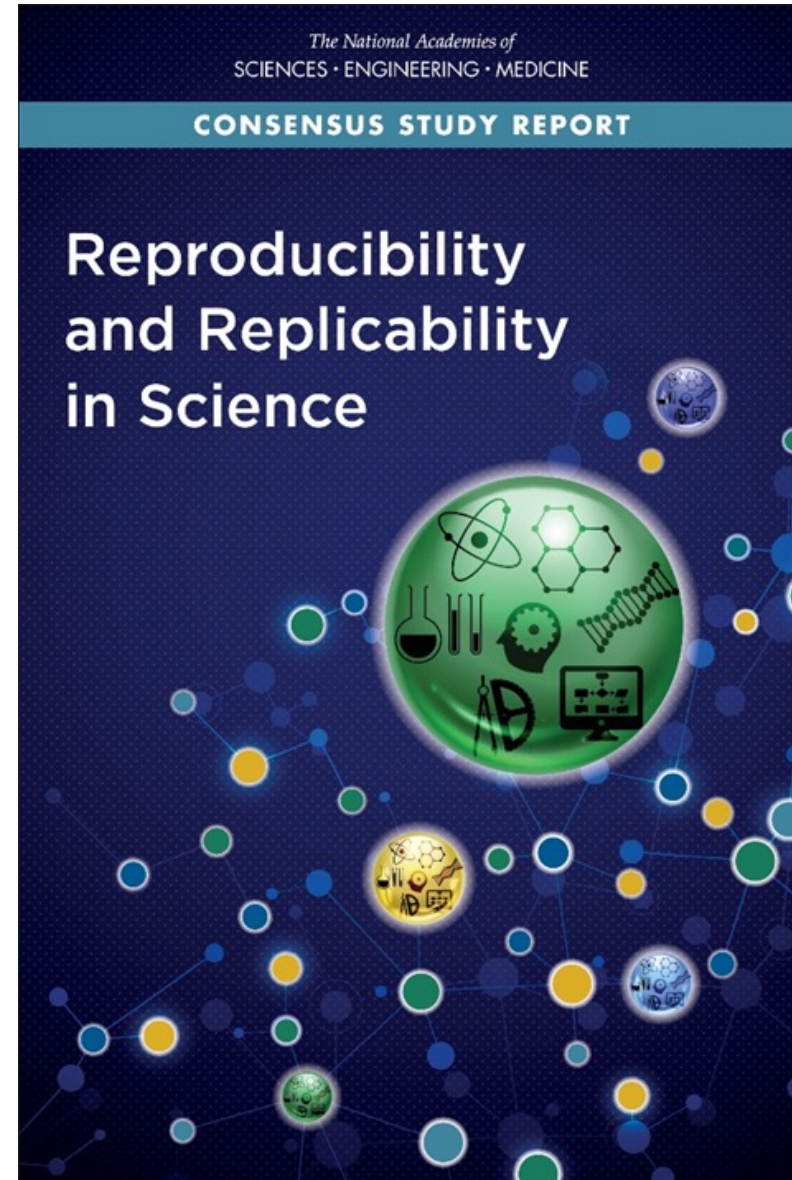
Open Science by Design

Background/Context

- Consensus study released in 2018

- Identify actions needed to move toward open science as the default for sharing research results

- Supported by Arnold Ventures

Key Findings and Recommendations

- The open science process should empower researchers to do better research

- Recommends actions to strengthen education, culture, data sharing and reuse, and supportive funding policies

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Reproducibility and Replicability in Science

Background/Context

- Consensus study released in 2019

- Task: Examine reproducibility and replicability, definitions, and efforts to improve

- Mandated by Congress, supported by NSF and the Sloan Foundation

Key Findings and Recommendations

- Defines reproducibility (consistent results from the same data/analysis) and replicability (consistent results across studies addressing the same question)

- Recommends actions for researchers, funders, societies, journals, etc. aimed at strengthening R&R

Key Themes from Recent Studies

- Strong connection between openness/transparency and reliability of and trust in the research enterprise

- Advancing reproducibility-replicability-openness is difficult, involves top-down policy approaches, grassroots efforts, and changes in culture/incentives

- Recognition that persistent, multi-stakeholder efforts are needed to move the research enterprise in the desired direction

- New approaches and solutions need to work for researchers

Ongoing and Planned Activities

Strategic Council for Research Excellence, Integrity, and Trust

- Convenes stakeholders across the research enterprise to develop ways to promote high-quality research practices and to anticipate and address challenges to research ethics and integrity

- Supported by the Moore Foundation and NASEM

- Co-chaired by David Allison, France Córdova, and myself

- Provides a venue for multiple stakeholders to collectively advance the research enterprise

- First meeting to be held in October

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Other Relevant Activity: Current and In Development

- NASEM hosts the US National Committee for CODATA, connection to international activities

- Roundtable on Aligning Incentives for Open Science (Completing first 3-year phase of activity)

- Developing a Toolkit for Open Science Practices (workshop proceedings to be published in October)

- *Issues in Science and Technology* to publish a series of articles in 2022 to advance ideas and spur discussion on how the scientific enterprise must evolve over the next 75 years

- Future of Methods Reporting (workshop to be held later in 2021)

Key Tasks and Roles for Societies

Key Tasks and Roles for Societies in Advancing Openness and Reproducibility

- Working with the Administration: response to the recent Scientific Integrity Request for Information and beyond

- Discipline-specific education and training around issues relevant to reproducibility and open science

- Discipline-specific standards and resources around issues of data sharing and stewardship

- Societies that also publish journals have additional tasks and responsibilities around standards, policies and resources

- **Many societies have been actively leading efforts to address some or all of these issues; how can we work together more effectively and take advantage of current opportunities to make progress?**